

Year 11 Chemistry Homework

Topic The Mole 2

1. Ammonium nitrate has the formula NH_4NO_3 .
 - a) How many atoms of nitrogen, hydrogen and oxygen are there in each molecule of ammonium nitrate?
 - b) Work out the percentage of each element by mass.(6)
2. In an experiment to make carbon dioxide, 2.0 g of magnesium carbonate (MgCO_3) was added to an excess of 1.0 mol dm^{-3} hydrochloric acid. The volume of carbon dioxide formed was 480 cm^3 at RTP.
 - a) Write an equation for the reaction. (2)
 - b) Work out the mass of product and reactants for one mole of magnesium carbonate being reacted.
 - c) Find the number of moles of carbon dioxide that are produced.
 - d) What mass of magnesium carbonate would be needed to produce 480 cm^3 ?
 - e) What is the purity of the magnesium carbonate? (This is the similar to working out percentage yields)(7)
3. 27 g aluminium are burned in a stream of chlorine to form 133.5 aluminium chloride.
 - a) How many moles of aluminium react?
 - b) How many moles of chlorine atoms react with aluminium?
 - c) Work out the empirical formula of the aluminium chloride.
 - d) Write a balanced equation for the reaction. (3)
 - e) The mass of one mole of the chloride is 267. What is the molecular formula of the compound?(7)
4. 22.2 g phosphorus reacts with 27.8 g oxygen to form an oxide.
 - a) How many moles of phosphorus is this?
 - b) How many moles of oxygen react with the phosphorus?
 - c) What is the empirical formula of the oxide?
 - d) Write a balanced equation for the reaction.(8)

TOTAL MARKS = 28